

AMENDMENTS TO THE DRAWINGS:

The attached replacement sheet of drawings includes changes to FIG. 9, and replaces the original sheet including FIG. 9.

In accordance with the Examiner's suggestion, FIG. 9 has been labeled as "--PRIOR ART --."

Attachments following last page of this Amendment:

Replacement Sheet (1 page)

Annotated Sheet Showing Change (1 pages)

REMARKS

This application has been carefully reviewed in light of the non-final Office Action dated March 29, 2007. Claims 1, 3, 5 and 11 have been cancelled, without prejudice or disclaimer of subject matter, and new claims 21 to 24 have been added. Claims 2, 4, 6 to 10 and 12 to 24 remain in the application, of which claims 2, 4, 6 to 10, and 12 to 20 have been amended, and claims 4, 6, 7, and 15 are the independent claims. Reconsideration and further examination are respectfully requested.

Initially, the Examiner's indication that claims 7, 8, 13 and 14 contain allowable subject matter is acknowledged with appreciation. In accordance with the Examiner's suggestion, claim 7 has been rewritten in independent form, and is therefore believed to be presently in condition for allowance.

The drawings were objected to under 35 C.F.R. § 1.83(a) for allegedly failing to show the features of a "pulse detecting unit," a "level detecting unit," and a "switching unit." Applicants respectfully traverse this rejection, as these features are clearly shown in FIGS. 4, 5, and 6, as pulse detecting unit 80, level detecting unit 90, and switch[ing] unit 70. To the extent that the Examiner disagrees, the Applicants further notes that, while it is true that 37 C.F.R. § 1.83(a) requires drawings to "show every feature of the inventions specified in the claims," it is also true that 37 C.F.R. § 1.81(a) only requires Applicant to "furnish a drawing of his or her invention where necessary for the understanding of the subject matter sought to be patented." See 37 C.F.R. § 1.81(a) (emphasis added). Given the generous written description of these components throughout the disclosure, the Applicants respectfully assert that one skilled in the art would readily understand these features, and that the drawings presently comply with statutory requirements. As such, reconsideration and withdrawal of the drawing objection are respectfully requested.

FIG. 9 has been labeled as "-- PRIOR ART --" in accordance with the Examiner's suggestion.

Claims 3, 4, 6 and 7 were objected to for allegedly including reference characters that were not enclosed within parentheses. Having deleted these references characters from the indicated claims, the Applicants request withdrawal of the objection and further examination.

Furthermore, since claim 7 has been amended to overcome the 35 U.S.C. § 112, ¶ 2, rejection, withdrawal of this rejection and further examination are also requested.

Claims 1, 2, 5, 6, 9 to 12, and 15 to 20 were rejected under 35 U.S.C. § (a) over U.S. Patent No. 6,005,538 ("Hoekstra") in view of U.S. Patent No. 5,515,390 ("Benton"); and claims 3 and 4 were rejected under 35 U.S.C. § 103(a) over Hoekstra in view of Benton, and further in view of U.S. Patent No. 6,926,573 ("Moon"). As indicated above claims 1, 3, 5 and 11 have been cancelled herein, without prejudice or disclaimer of subject matter, and without conceding the correctness of the rejection. Withdrawal of the § 103 rejections and further examination are respectfully requested.

According to the present disclosure, *inter alia*, a detection signal is output indicating that the level of the pulse voltage is fixed, when detecting that the number of pulses per predetermined time period, counted by the counting unit, is equal to or is less than the number of a reference pulse number.

Referring to particular claim language, independent claim 4 recites a driving circuit for a vacuum fluorescent display, including a counting unit configured to count the number of pulses per predetermined time period of a pulse voltage for pulse-driving a filament of the vacuum fluorescent display. The driving circuit also includes a detecting unit configured to output a detection signal indicating that the level of the pulse voltage is fixed, when detecting that the number of pulses per predetermined time period, counted by the counting unit, is equal to or is less than the number of a reference pulse number.

Independent claim 6 recites a driving circuit for a vacuum fluorescent display, including a counting unit configured to count a time period for which the level of a DC voltage produced by integrating a pulse voltage for pulse-driving a filament of the vacuum fluorescent display, shifts to the level indicating that the level of the pulse voltage is fixed. The driving circuit also includes a detecting unit configured to output a detection signal indicating that the level of the pulse voltage is fixed, when detecting that the time period counted by the counting unit is equal to or longer than a predetermined time period.

Independent claim 15 recites a driving circuit for a vacuum fluorescent display, including a filament driving unit configured to pulse-drive a filament of the vacuum fluorescent display with a pulse voltage, and a grid driving unit configured to drive a grid electrode of the vacuum

fluorescent display. The driving circuit also includes a segment driving unit configured to drive a segment electrode of the vacuum fluorescent display, and a detecting unit configured to output a detection signal indicating that the level of the pulse voltage is fixed, when detecting that the level of the pulse voltage is fixed, based on the number of pulses per predetermined time period of the pulse voltage or on a DC voltage produced by integrating the pulse voltage. The driving circuit further includes a control unit configured to control the filament driving unit, the grid driving unit, and the segment driving unit, in order to terminate the driving of at least one of the filament, the grid electrode, and the segment electrode, based on the detection signal.

The applied art is not seen to disclose, teach or to suggest the foregoing features recited by the independent claims. In particular, neither Hoekstra, Benton nor Moon are seen to disclose, nor does the Office Action even assert that these references describe, at least the feature that a detection signal is output indicating that the level of the pulse voltage is fixed, when detecting that the number of pulses per predetermined time period, counted by the counting unit, is equal to or is less than the number of a reference pulse number.

Hoekstra describes a vacuum fluorescent display driver and method for driving a vacuum display device, that includes a segment selecting circuit which selectively applies a potential of a particular polarity to a segment to illuminate that segment and a grid driver circuit which applies a potential of that polarity to the grid in order to illuminate the device. *See* Hoekstra, Abstract. In particular, a segment select circuit 42, a digit ON and OFF circuit 46, and a filament supply circuit 49, are merely seen to be configured to apply a rectified voltage obtained by rectifying through a diode 64 a voltage applied to a filament 26, to the segment select circuit 42 and the digit ON and OFF circuit 46. *See* Hoekstra, col. 3, ll. 40 to 55. Hoekstra is not seen to disclose, however, at least the features that a detection signal is output indicating that the level of the pulse voltage is fixed, when detecting that the number of pulses per predetermined time period, counted by the counting unit, is equal to or is less than the number of a reference pulse number.

Benton is not seen to remedy the deficiencies of Hoekstra. In particular, Benton is seen to provide for the detection of errors in an electro-optic display of a type including one or more capacitive display elements. *See* Benton, Abstract. According to Benton, the output of a driver 5 is put in a high-impedance status for a test time period T_S of an LCD, and an error warning

indicating that the voltage at electrodes 3a, 3b is not normal is generated when an electrode potential difference V_E decreases below a reference voltage V_{REF} . *See* Benton, col. 3, ll. 34 to 36. Benton is not, however, seen to disclose at least the features that a detection signal is output indicating that the level of the pulse voltage is fixed, when detecting that the number of pulses per predetermined time period, counted by the counting unit, is equal to or is less than the number of a reference pulse number.

Moon is not seen to remedy the deficiencies of Hoekstra and Benton. In particular, Moon describes, in an aging apparatus of a field emission display (FED), a method capable of reducing damage occurring in applying of a direct current high voltage to an anode electrode of a FED to perform aging, ostensibly increasing life span of the FED and reducing a time required for aging. Nowhere is Moon seen to describe, however, at least the features that a detection signal is output indicating that the level of the pulse voltage is fixed, when detecting that the number of pulses per predetermined time period, counted by the counting unit, is equal to or is less than the number of a reference pulse number.

Accordingly, the combination of references do not support a prima facie case of obviousness.

Finally, as to a formal matter, several of the other claims have been amended to alter dependencies, and to correct minor editorial errors.

Based on the foregoing arguments, independent claims 4, 6 and 15 are believed to be allowable over the applied references. The other rejected claims in the application have each been indicated as containing allowable subject matter, or are each dependent on these independent claims and are thus believed to be allowable over the applied references for at least the same reasons. Because each claim is deemed to define additional aspects of the disclosure, however, the individual consideration of each claim on its own merits is respectfully requested.

Finally, in the Office Action, the Examiner advised the Applicants to provide a copy of the reference indicated on ¶ [0030]. A copy of this reference, along with an English-language translation, is provided in the Information Disclosure Statement that accompanies this Amendment.

No other matters being raised, it is believed that the entire application is fully in condition for allowance and such action is courteously solicited.

Respectfully submitted,

Date; June 28, 2007

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